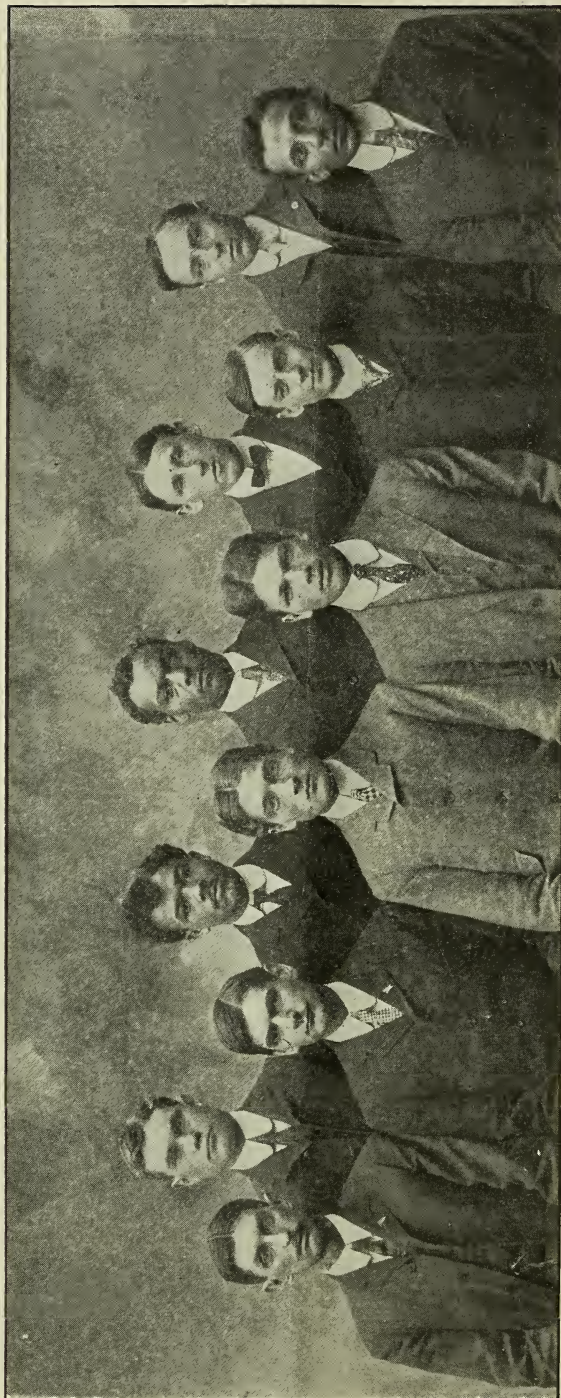


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CLASS OF 1903—COLLEGE OF AGRICULTURE

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ISON

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This issue completes the ninth volume of the publication of this magazine and we wish to take this opportunity of thanking those of the staff and others who have aided us during the year. While there has probably been nothing extraordinary or strikingly commendable in the character of the publication we have endeavored to adhere to the standard laid down at the beginning of the volume, and to what extent we have succeeded our critics will determine. Substantial improvements and the correction of some of the most glaring faults of this volume are contemplated another year.

Nothing has so aroused the students of the Agricultural College as the news of Professor Hunt's resignation. None knew better than the students with whom he has come in contact, his sterling qualities and ability as Dean of the College, as an instructor and as a man. Professor Hunt came here as Dean of the Agricultural College only a few years ago, and through his efforts the College of Agriculture at the Ohio State University is now everywhere recognized as

one of the foremost in the land. No college in the University has made so rapid progress, and the prospects for the future were never better.

Not only the Agricultural College but the whole University suffers by his resignation. There is not a man on the general faculty whose opinion, wisdom and judgment on University affairs is more sought after and respected than Professor Hunt's. Good men in every line are in demand by other institutions at much better salaries than they are getting here, and it is to be hoped that conditions will very soon be such that it will be possible to keep the good men at good salaries. The poorer ones are dear at any price.

We are in receipt of the initial number of *The Demeter*, a monthly journal which is to be published by the Agricultural Club of the Louisiana State University, under the editorship of E. S. Hardy. The edition contains twenty-four pages with neat illustrations and a pleasing cover, while the contributions are timely and well written. The constant increase in the number of college agricultural periodicals indicates the rapid advancement in agricultural education and such a publication is a truthful criterion of the rank of the institution from which it issues. We extend our best wishes to the new periodical for its most abundant success.

The fact that foreign governments are continually looking to the United States for men trained in agriculture is a noteworthy compliment to our system of agricultural education. The placing of students in our agricultural colleges by foreign governments, the calls for men with thorough agricultural training by

these nations, are significant facts and are explained only on the basis of the worth of our system. The Argentine Republic, Japan and Egypt—countries with agricultural possibilities—are among the number that are applying for help. This demand is increasing and will undoubtedly continue, and it should stir us to our very best efforts and most careful plans to prepare men properly to fill such places. The practice of agriculture is old, but the science is new, and people are now rapidly coming to realize that agricultural specialists are as necessary to agricultural development as specialists in any other science is to its development. No country is better fitted naturally to furnish specialists in agriculture than our own and we should arrange our educational system to meet the demand that is being made upon us. Of course there are more immediate, more practical demands which must also be met, the farmers of our own country are legitimately the first to be aided; yet the thorough preparation of men should go hand in hand with the more practical work of aiding farmers and in training such students as present themselves for entrance into what we term the short courses. There are at present, then, two distinct demands on our agricultural educational system. How long these demands shall exist will depend upon the manner in which our system is developed. Surely if either demands fails, the one for practical work will be the one to go, and this only when the subject of agriculture is systematically introduced into all secondary and rural schools. The other will increase as the demand for specialists in other lines has increased, and our system and courses should be shaped to meet its requirements.

Thomas Forsyth Hunt.

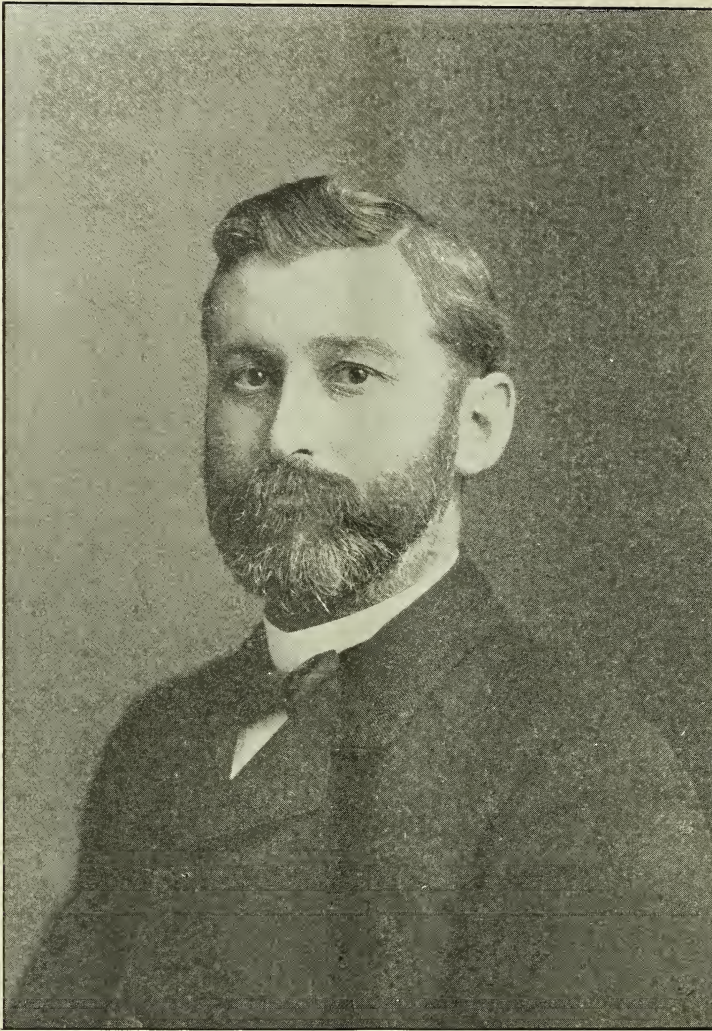
It is with deep regret that we are compelled to announce the resignation of Professor Hunt as Dean of the College of Agriculture and as Professor of Agriculture at the University. The blow comes with a stunning force to the college and the final result cannot be predicted. Suffice it to be said that we can in no sense expect to fill Professor Hunt's place, however widely we may search, although it is hoped that the solid foundation which he has laid will mean the final success of the college, notwithstanding the shock it receives in his loss.

It is well known that the Cornell College of Agriculture is this year undergoing a complete reorganization owing to the retirement of Professor Roberts, and it is to this that we attribute our loss. It seems to be the idea of those in authority at that institution to develop the strongest agricultural college in the country and to this end they have been seeking the most efficient instructors that can be found. For the deanship they naturally turned to one of their own number who was fully informed as to the prevailing conditions, but for the head of the department of instruction Professor Hunt was their only choice. Seeing much larger opportunities in this new field for the development of the ideas in agricultural education which have given him a national reputation, Professor Hunt naturally accepted the proffered position.

Professor Hunt began his work at the Ohio State University in January, 1892, at which time the College of Agriculture contained a handful of students and was housed in a single room in the main

building. Under his guidance and through his efforts the number of students has been greatly increased, the present agricultural building has been constructed and the course of instruction widened and improved until today it ranks among the first in the country regarding the character of the work done. Professor Hunt is a man with a width of view and an appreciation of pedagogical principles as applied to agricultural instruction rarely if at all equalled among our present day agricultural educators, and these qualities have been largely responsible for the high grade of our present course of instruction. In short, Professor Hunt has been endeavoring to develop an agricultural college and not an agricultural school. His ideals are high and he has sought to embody the most advanced ideas in agricultural education into the work of the college. In this he has largely made his reputation and as is universally admitted none stand higher in the field of agricultural education. The Graduate School of Agriculture held last year at this institution was an idea original with Professor Hunt and the prominent place he occupies in the work of the American Association of Agricultural Colleges and Experiment Stations also testifies to his ability and standing as an agricultural educator.

Professor Hunt's whole career has been one of achievement and rapid progress. Graduating from the University of Illinois in 1884 he was assistant to the state entomologist, 1885-6, Assistant in Agriculture at the University of Illinois, 1886-8, Assistant Agriculturist of the Illinois Experiment Station, 1888-91, and Professor of Agriculture at the Pennsylvania State College, 1891-2. He



THOMAS F. HUNT.

therefore came to his present position with an experience and training that fitted him admirably for the work, and the manner in which he has succeeded is too well known to need comment. Practical, broad-minded, clear cut in his

ideas, gifted with a natural ability to quickly grasp a situation he has made an ideal dean. As an instructor he has been a wonderful inspiration to the hundreds of students who have passed under him and all unite in his praise. Never

was a man more honored and respected by a student body, and his loss will be deplored by everyone who has ever been connected with the Agricultural College. But to those who have been associated with him in his work the loss is most appreciated. Filled with an intense love for his work and displaying an interest and enthusiasm that was at once natural and contagious he inspired all about him to greater endeavor and higher aims. Quiet in manner, most congenial in temperament he was always ready to help in any way possible those associated with him, yet at the same time his firmness of manner and steadiness of purpose impelled honor and respect.

In the general faculty no man was more generally known and respected, and the most profound regret was manifest on every hand when the fact of his withdrawal became known. He will leave a host of friends in both city and University.

As to the future plans for the College of Agriculture little can be said, as the matter of appointing a successor has as yet not been considered.

This might be said, however, that with the splendid foundation laid for agricultural education in Ohio by Professor Hunt, the proper man as his successor has a remarkable chance to build up a magnificent college of agriculture. The demand for education is here, the corner-stone is laid and it only remains for some one to build the superstructure. Ohio's prospects were never brighter from the view point of the agricultural educator, and if sufficient support is given, and a man that in any way approaches to the worth of Professor Hunt can be obtained, our future is assured.

We frankly acknowledge the loss of the man whom we believe most capable for conducting such work, but we have

no reason to be discouraged. And while Cornell is to be congratulated upon her success in securing Professor Hunt, and while our loss is emphatically Cornell's gain we should not be pessimistic regarding the future. A master mind has laid the plans and foundation, it is now perfectly possible to complete the edifice so that it shall be the pride of the State of Ohio.

Professor Hunt takes up his new work July 1. and his successor will probably be chosen by that time.

Graduates in the College of Agriculture and Domestic Science.

DOMESTIC SCIENCE.

Lucy B. Clawson came to the University from O'Keana, Butler county, Ohio, where she was prepared in the New London High School. She entered the course in Domestic Science in the fall of '98 and has been here continuously since, having completed the work of both the long and short courses. During her course Miss Clawson has shown herself a capable and earnest student, and has done considerable special work, as well as some instructional demonstrating. She was a member of Philomathean Literary Society and has acted at various times as its President, Secretary and Treasurer. She was also an active member of the University Y. W. C. A., has served on the staff of the Agricultural Student and taught Domestic Science for two years in a philanthropic institution for the poor of Columbus. The subject of her thesis is "Economic Values of Dietary Investigations and Suggestions for Practical Dietary Work in the Home."

Mary G. McMahon is a Columbus girl, and was prepared in the city High Schools, entering the long course in Domestic Science at the University in the fall of 1899. Throughout her course Miss McMahon has shown herself to be a student of ability and has won the universal commendation of her instructors. Her thesis work, which has been on "Plans, Specifications and estimates of a Young Women's Building at Ohio State University," is exceptionally valuable and shows much care, ability and originality.

Faith R. Lanman was prepared for her university work in the schools of Columbus. She entered the long course in Domestic Science in September, 1899, and has been in the University since that date. She has been a thorough and most conscientious student and has made an excellent record in her work. She has been very actively interested in the work of the Y. W. C. A. throughout her course, to which she has devoted much of her spare time. Her thesis subject is "A Study of Wheat and Its Importance in Food Economics."

AGRICULTURE.

Theodore W. Ditto was raised on a farm at Delphos, Ohio, where he received his early education in the country schools; later he spent three years in Elida High School, entering O. S. U. in the year of 1896 in the short course in Agriculture, which he completed in 1898. In 1900 he returned to the University and entered the long course in Agriculture and has been here continuously ever since.

He has been actively connected with the Agricultural Students' Union and is at present Director of the Division of Apiculture. He has also been an active member of Townshend Literary Society,

acting as its President during the spring term of his Senior year, and representing it on the Makio Board. He has been a member of the Political Science Club, the Biological Club, the University Y. M. C. A. and the Prohibition Club, having acted as president in the latter organization during this year. At the State Fair, in 1901, he won first place in the students' judging contest for dairy cattle and represented the Agricultural College at the Chicago International in December of the same year.

He has shown his interest in agriculture in being an active member of the Grange, in which he has held important positions. The subject of his thesis is "Aphididae of Ohio." Mr. Ditto has been a thorough and conscientious student and has shown marked ability and industry in his course. He is at present a member of the Agricultural Student staff, on which he has done commendable work.

C. A. McClelland was born at Terrace Park, Ohio, where he received his early schooling, graduating from the Terrace Park High School in 1899. The next year he entered the long course in Agriculture at the University, where he has brought much distinction upon himself by his ability and earnestness as a student. He has made his special work in Agronomy.

As a member of Townshend Literary Society he has shown much interest and enthusiasm, serving as its president during the fall term of his Senior year. He is also a member of the Agricultural Student staff, where he has served with merit. The subject of his thesis is "The Adaptation of Alfalfa to Ohio," upon which he has done some valuable work.

Lloyd Jones was raised near Chesterhill, Morgan county, Ohio, where he re-

ceived his early education in the Public School, later moving with his parents to Franklin county, where he entered the short course in Agriculture at the University in 1898. After completing this, he changed and entered the long course in the fall of 1900, and has been in the University continuously since.

Mr. Jones has shown a lively interest in his work and has been a very earnest student. The subject of his thesis is "The Milk Supply of Columbus."

He has lived with his parents on a farm just outside the city during his course, aiding them in their farm work, and thus depriving himself to a certain degree of the University privileges. He will probably enter practical agriculture on the completion of his course.

Clarence B. Hoover was born at Ross, Butler county, Ohio, where he was prepared in the Public Schools and in the Venus and Hamilton High Schools. He entered the University in 1899 and has been in attendance since that time. During his college course he has given special attention to the study of bacteriology and soils, and the subject of his thesis is "Soil Types on the Ohio State University Farm."

He was an active member of Townshend Literary Society, having served as its president during the winter term of his Senior year. He is also a member of Alpha Zeta fraternity, the 'Varsity "O" Association and of the Agricultural Student staff. He has played left field on the 'Varsity baseball team each season since entering school. Mr. Hoover has shown himself a thorough and conscientious student and has displayed much originality and ability in his work.

Frank E. Hamilton was reared on a farm near Brownsville, Licking county, Ohio, where he received his early train-

ing in the public schools, later attending the Madison Township High School and Normal School, where he prepared for entering college. He came to the University in the fall of '98, entering the long course in Agriculture. During his entire course Mr. Hamilton has shown exceptional ability as a student and from January to September, 1902, was foreman of the University farm. He was an active member of Townshend Literary Society, the University Y. M. C. A. and the Prohibition Club, where he has held important offices.

Mr. Hamilton has done special work in chemistry and animal industry and won second prize in the students' judging contest for beef cattle at the State Fair in 1901. He also was a representative of the College at the students' judging contest at the Chicago International the same year. The subject of his thesis is "Factors Effecting Milk Yield."

Mr. Hamilton has already considerable important offers in agricultural work and his ability will undoubtedly insure him an important place in some such line in the future.

Ollie W. Ferguson was born at Lima, Ohio, but later his family moved to Wilmington, where he received his early education. He entered the Zanesville High School in 1894, graduating four years later. In the fall of '99 he entered the long course in Agriculture at the University and has been in attendance since that date. During his college course Mr. Ferguson has given especial attention to agricultural chemistry, doing considerable special work in this subject and showing a keen interest in all lines of chemical investigations. The subject of his thesis is "Experiments with Root Tubercles."

Mr. Ferguson expects to follow the line of his specialty after leaving school.

Charles C. Poindexter was born in Pennsboro, West Virginia, and received his public school training at Parkersburg. In 1893 he entered the West Virginia Colored Institute, graduating from the Normal Department in 1896, and from the Academic in 1899. He was very proficient in his work in this institution and from 1897 to 1899 was assistant instructor and librarian. During the summer of 1897 he studied business and stenography at Michael's Business College, at Logansport, Indiana, and in the summer of 1898 received a diploma in stenography from the Logansport Commercial High School.

Mr. Poindexter entered the University in the fall of '99 and has pursued the long course in Agriculture. He has been an active member of Townshend Literary Society, the University Y. M. C. A. and the Biological Club. He has given especial attention to botany while in school and has occupied the position of stenographer to Professor Kellerman since the spring of 1900. He has been universally known as an apt and earnest student and has won several prizes in contests during his course. The subject of his thesis is "The Development of the Flower and Embryo of Corn." Mr. Poindexter was offered a position in his Junior year at the Tuskegee Institute, but refused, as he wished to complete his schooling. He will be private secretary to Professor Hunt during the coming year and he intends also to take his Master's Degree from Cornell.

Otto E. Jennings was reared on a farm near Olena, Huron county, Ohio, attending the District School, and later the North Fairfield High School, from which he graduated in the spring of 1895. In the fall of 1898 he entered the long course in Agriculture at the State University, depending largely upon his own

work for his support. During his course he has given much attention to botany and held the position of florist at the Botanical Department from April, 1901, to June, 1902, from which time to the present he has been assistant in botany, aiding in instructional and department work.

He was a member of the Biological Club, Wheaton Club, Townshend Literary Society, the Ohio Academy of Science, Alpha Zeta fraternity and the University Y. M. C. A.

In his botanical work he has shown marked ability. He has read several papers before the Ohio Academy of Science and has contributed considerably to such periodicals as "Science," the "Ohio Naturalist" and the "Horticultural Journal." During his Senior year he was honored with an election to the Society of Sigma Xi. His thesis work has been upon "Corn Smuts," in which line he has done valuable work. Mr. Jennings is a most capable and thorough student and a man of amiable disposition, very popular with the student body.

J. Byrl Crabb is a native of Madison county, Ohio, where he received his early education in the Public Schools, later attending the Mt. Sterling High School in preparation for his university course. He entered the short course in Agriculture in the fall of 1898, which he completed two years later, when he entered the long course. In all of his college work Mr. Crabb has shown himself a diligent student; he has given special attention to animal industry, having won prizes of importance in student judging contests.

He was a member of Townshend Literary Society, where he took an active interest in the work. The subject of his thesis is "The Conformation of Percheron Horses." After leaving

school Mr. Crabb expects to follow the line of practical agriculture near Washington C. H., Ohio.

HORTICULTURE AND FORESTRY.

Lee D. Twitchell came to the University from Mansfield, Ohio, where he was prepared in the Public Schools and the Mansfield High School. He entered the course in Horticulture and Forestry at the University in 1897, but was out of school two years since that time. He is an industrious and practical student and has completed his course very credibly. He was a member of the Townshend Literary Society, where he has held important offices, and has taken an active interest in the work. The subject of his thesis is "A Study of the Development and Keeping Qualities of Apples and Pears."

Mr. Twitchell will enter practical horticulture at Mansfield on leaving school, making a specialty of apple growing.

Frank C. Long was raised on a farm in Preble county, Ohio, receiving his early education in the Public Schools of that county. He entered the West Baltimore High School in the fall of 1894, graduating in 1898. The same year he entered the Ohio State University in the course in Horticulture and Forestry. He has been a member of Townshend Literary Society and during the last two years of this course has been one of the proprietors of the University Supply Store, through which he has become widely known by the student body. His thesis work has been on "Plans for the Building and Grounds of a Rural Home."

Agricultural Education in Minnesota.

Agricultural education is rapidly growing in favor in every state which has an agricultural college. Cornell Univer-

sity has done a great work in introducing nature study into the schools of the State of New York. The Agricultural Students' Union of Ohio, in connection with the College of Agriculture and Agricultural Experiment Station is creating greater interest among the farmers of the state in agricultural education. In each state there has been a wide space between the public schools and the college of agriculture. The colleges have been trying to bring the schools in closer touch with them, especially the schools whose enrollment is chiefly composed of boys and girls from the farm. The work has been of an experimental nature and while none have been able to offer a complete solution yet all have served to get the farming class interested in agricultural education.

The State of Minnesota recently inaugurated a system of agricultural high schools to serve as the connecting link between the rural school and the agricultural college. No state is better able to inaugurate such a system than is Minnesota, for they have been working with this subject for several years, making changes in their course from time to time as occasion demanded, until now they have a first-class course which is well worth the consideration of any boy who contemplates spending two or three years in school before beginning life as a farmer.

The school was organized in 1888 with eighteen members, and has steadily grown until the enrollment for 1902 was 440, with a total of 619 in all courses in the Department of Agriculture. The Minnesota School of Agriculture admits students from any school in the state who have completed the first eight grades and have an honorable standing in deportment. In this respect it takes rank with the regular high schools of the state, offering besides the regular

common branches those studies relating especially to agriculture and nature study. The course requires three years for completion and admits the student in the College of Agriculture, which gives a four-year course equal to any other in the University of Minnesota.

The School of Agriculture differs from the means used in other states, in that it is aiming to take the work of the high school and change it by putting agricultural work in the course as a substitute for other unnecessary work. In Ohio the short course in agriculture offered by the O. S. U. receives students who have taken one or two years' work in a credited high school and bring certificates showing work done in mathematics, history, geography and grammar. This course requires two years' work.

Our school system is being formed to give to the agricultural classes an education equal to that of any other class, and to make this work a success will require financial aid from the state. The agricultural colleges have been given aid when needed, but as only about one out of every nine high school students enter college the agricultural high schools will meet the wants of a larger number of students than can the colleges.

When the present high school system was found to best serve the need in city education the state came to the aid with finances and no one will for a moment doubt the value of this system.

The agricultural college has been referred to as the "controlling head of the pyramid" of agricultural education.

If it is, then we have one instance of pyramid building by beginning at the top and working downward. And now, after having a top for our pyramid we are trying to put a base under it in the form of agricultural high schools, and by the introduction of elementary agriculture, or nature study, into the

rural schools. Such a system will require time to develop and financial aid to bring it to completion, but if the people demand it the latter will be supplied.

For fourteen years Minnesota has had a School of Agriculture in connection with the Department of Agriculture of the State University, and it is now proposed to provide a similar course of study for the high schools of the state. "Six hundred students in an agricultural high school, and 15,000 students in city high schools is not in just proportion to the school population of city and country.

The states greatest interests are its farms and its country homes. No other instrumentality has been found excepting the rural schools, which is so important an agency for building up the country as the agricultural high school."

For want of a school of agriculture the boys and girls of the country go to the city high schools and continue their education in a course which leads away from rather than along subjects which are related to agriculture, and the boy or girl who looks forward to a life on the farm is receiving a training not designed to meet their wants in helping solve questions which will arise in connection with their life work. We are living in an age devoted more to specialists than to general methods, and the persons who spend their time taking a course made up of subjects which will not be a benefit to them, save in mind training and storing of knowledge that they can not use, will not find themselves as well prepared for their work as those who study subjects related to their proposed work and which gives excellent mind training as well.

The State of Minnesota has not been neglecting the needs of its School of Agriculture, for in April, 1901, the state legislature passed a law giving to the Department of Agriculture of the Uni-

versity of Minnesota the work of helping introduce the subjects of agriculture and household economics into the rural schools of the state. An appropriation of \$4,000 was made to be used in the carrying on of this work during the period, July 31, 1901, to July 31, 1903.

The Board of Regents of the University assigned the full direction of this matter to William M. Liggett, Dean of the College of Agriculture. Professor Willet M. Hays was put in charge of the work, and under his direction a bulletin has been published containing exercises prepared by members of the Department of Agriculture of the University, for use in the rural schools, to be distributed in co-operation with the State Department of Public Instruction.

In order to prepare many of the rural school teachers for taking up the use of this bulletin, Superintendent Olson of the Department of Public Instruction sent instructors to a number of the summer schools during July and August, 1902. It is the aim of the College of Agriculture to aid in every way possible the state superintendent, and the county superintendents, in making the rural schools more efficient organizations for "the education of the farm boy and girl effects not only country but city life as well."

As at present outlined Minnesota's plan may not solve the question of agricultural education for rural and high schools, but it is a step in the direction of better methods for such work. At any rate it is worthy of the careful consideration of educators throughout the country.

T. W. DITTO.

A school for tanning industry, the first to be established in Italy, was opened at Turin in December. The school was founded by the local association for the tanning industry.

Some Notes on the University Live Stock.

The working material of the Department of Animal Husbandry is making a very decided growth during this, the first year of its creation. As has been noted in the columns of the Student from time to time a number of choice animals of the delinquent breeds of live stock have been added to those already on the farm at the beginning of the year. Heretofore, very little breeding has been done outside the herd of dairy cattle and that of swine. In the cattle, the breeding has been limited to Jerseys and Holsteins. In hogs, the Berkshires, Poland Chinas and large Yorkshires are represented in the breeding lots. An example of the production in this line is a pen of Berkshire barrows that weighed 480 pounds each at 12 months old, and not in high flesh either. Look out for these fellows next fall; they will be worth seeing. It is now the aim of the department to work into select herds and flocks of the different breeds, as fast as possible, that will be a credit to the Agricultural College of this great agricultural state. As the shorthorn interests of Ohio are of such vast importance it is proposed to add a choice herd of this popular breed first, to be followed by herds of other beef breeds as circumstances will permit. The Shorthorn, Aberdeen-Angus and Hereford breeds are each represented by a small lot of good steers. The best of these will be shown next fall, and kept for class room use.

The Jersey herd has recently been strengthened by the purchase of some choice breeding stock. Perhaps the most important of this lot is a young herd bull, King's University Lad, bought from Mr. Frank Hart, of Cleveland. He is a very promising animal individually, being of the true dairy type

and possessing plenty of quality along with that depth and thickness of chest that indicates stamina, a quality too often lacking in high bred Jerseys. But it is not his individuality alone that is worthy of mention; his blood lines trace back through generations of ancestors of the best business type. His sire is King of St. Lambert's King, known as "Hart's King," the sire of 29 tested daughters ranging from 14 pounds to 24 pounds of butter in 7 days, and a bull that is not only of the richest breeding but one considered to be the most prepotent Jersey sire in America today. The dam of King's University Lad is Exile's Kalima, test 18 pounds 15 ounces in seven days. She was sired by Exile of St. Lambert and is out of Volie of Sennett, test 14 pounds 13 ounces. This young fellow is worth watching and visitors to the farm should look him over.

At the combination sale of the Ohio Jersey Cattle Club of April 17, in this city, Prof. Plumb added four choice cows to the female breeding stock by the purchase of Lady Alta, Carrie Cooper, Victor's Domina and King of St. Lambert's Jewel of C. H. The official test of the last named cow is not yet completed, but she is making an excellent showing, although not being pushed by high feeding. She has given in nine consecutive milkings 201 pounds of milk, containing 8.33 pounds of butter fat, equivalent to 10 pounds 6 ounces of 80 per cent. butter, a rate of over 16 pounds of butter in seven days. As her name indicates, she is of St. Lambert blood and is a very promising cow.

A. S. NEALE.

Plant Breeding.

Thremmatology is the science of breeding, or, it is that branch of biology which treats of the breeding of animals and plants, their congenital variations,

and the perpetuation of those variations. Thremmatology as treated here, or as applied to the plant kingdom, is in a very undeveloped state.

While people have for many years known some of the laws and principles which govern animal breeding, it has only been a very few years since any one thought of such a thing as breeding plants. However, we can see at a glance that nature has, since time began, employed better methods of breeding in the animal kingdom than she has in the plant kingdom. Therefore, how necessary it becomes for the farmer to assist the plant kingdom to come to a par with her sister kingdom. Wherever we find the horse, the cow or the hog running wild, we find them led or headed by a male, the best to be found in the herd. This superior animal, and the leader of the herd because of his superiority, becomes sire to a very large per cent. of the offspring of the herd. This is not true in the plant kingdom to any great extent. Of course we have "the survival of the fittest," but this is probably of less importance. For example, one can easily see that the staminate flower of the corn plant in our corn fields is, even more than likely to be fertilized by the pollen from an inferior, or at least a common stalk of corn, rather than receive its pollen from a pistillate flower from a stalk of superior merit.

The application of the principles of breeding to the plant kingdom has been delayed for several reasons. First might be mentioned the lack of knowledge of the sexuality of plants. It was not until 1691 that the function of pollen was discovered, and it is probable that not one-half of the adult population of even this enlightened country understand the function of pollen, or even know that plants have sexuality. The people who have made a thorough study of such problems are very rare indeed.

The second reason that we would mention which has delayed the application of the principles of breeding to plants is, that the breeding of plants is much more difficult to control than is the breeding of animals. While man can control completely the animal which he wishes to use for a sire, he finds it quite a different problem when he tries to control the transference of pollen from the male to the female flower of a corn or wheat plant. Many different means are being devised at the present which will materially aid man in controlling this complicated operation, and when he does have in his control the breeding of plants then it behooves him to be very careful in his method of selection of the embryo plants. As one has said, "Selection is the surest and most powerful instrument that man possesses for the modifications of living organisms." The individual plant, produced from the seed, is the important unit in plant breeding. By selecting those plants which upon trial produce superior progeny, the whole variety may be slightly or considerably improved. Since the plants of each succeeding generation also vary, by repeatedly choosing the best, the variety or race is further improved.

As a general rule crossing increases variation, both towards better plants and towards poorer ones, thus giving opportunity to select from among the best plants, individuals which could not have been secured without it. The farmer in selecting his seed wheat (if he uses any selection whatever), does it by means of his fanning-mill, which method we can see at a glance is very far from a rational one. While he evidently does get the largest and heaviest seeds or kernels, he knows nothing whatever of the plants which produce them. And he is much more apt to get seed from heads which produced but few kernels (therefore

large) or from a plant which grew only one or two stalks or stools.

The corn plant, by the very nature of the seeding body and the common method of harvesting, has been improved more than any other crop, says one writer, but yet there is great chance for improvement. The selection which has been used in the corn plant has been the largest scale selection experiment ever carried on, and yet it has been done almost unconsciously. The farmer when husking his corn has been impressed with the rapidity at which his basket or wagon bed has filled when husking large well filled ears, so that when he comes to selecting his seed corn next year, he almost involuntarily has carefully selected such ears from which to get his seed corn.

Could the farmer have known just which of these fine ears came from good thrifty early maturing stalks, which ones came from stalks with two ears, and which of these ears had the power of transmitting these characteristics, then he would have had a more nearly perfect method.

One of the most important parts of plant breeding is the testing of new varieties, as to their powers of reproduction, transmission, etc. This is of vital importance, for it has been found that of the many superior plants which **might** have been selected, only a comparatively small per cent. have the power of transmitting desirable characteristics.

Another principle of great importance to note is the advantage in using large numbers. The ease with which the plant breeder can procure large numbers is the principal advantage which he has over the breeder of animals. While the breeder of animals cannot without considerable outlay of money experiment with but a few individuals, it is only a matter of choice with the plant breeder

whether he works with ten, one hundred, or a thousand plants. The cost of material is hardly to be considered.

The more men study the question of plant breeding, the higher do they place the mark of possible attainment. When we realize what an improvement has been made in the sugar beet, we can easily imagine, that by as careful selection and persistent efforts, we may increase the value of our staple grain crops to an extent we do not dream of now.

Testing of the finished variety must include, adaptability to soil and climate, the quality and value of the resultant crops, and the relative cheapness and practicability of its production.

We must also be careful in choosing the qualities toward which to work. Some qualities are naturally antagonistic, such as, great size and number of parts, great productiveness and extreme earliness, great size and deep coloration, etc. We should select the most desirable characteristics and bend all our energies toward the acquirement of them.

As a single example of improvement in a plant by crossing and careful selection may be cited the work done by the Minnesota Experiment Station with wheat which they now call Minnesota No. 169. In five years this variety was made to increase on an average of 5.3 bushels per acre on the Experiment Station farm, and an average increase of 2.7 bushels per acre on other farms in the state.

It has been carefully demonstrated and figured out by specialists along this line that in ten years the value of our crops grown could be increased \$3,000,000,000, an amount equaling the value of our crops for one year. All this could be secured at a cost not to exceed \$30,000,000, or one per cent. of the value of the increase. When we consider some of these statements and many

others just as startling, we can easily see that the possibilities of the plant breeder are almost limitless and that the field which is open to him is a wide one.

EARNEST D. WAID.

The Mission of Animal Husbandry.

It was not until Darwin had proved and reproved his theory of evolution that improvement of animals by care and breeding became universally recognized by the world. People began to realize that a great revolution in the live stock industry was to be effected by the application of scientific methods. By care in breeding, animals attained greater perfection and in much less time were able to be fattened for the show ring. So clearly was this proved by certain scientific breeders, that the government, in order to promote animal husbandry, established agricultural colleges where these methods might be put into practical operation. "One of the wisest things this government ever did was to make ample provision for the great agricultural institutions in this land."—(McKinley.)

Today agriculture is taught in these colleges by approved scientific methods. The agricultural college is in fact the basis of the whole agricultural world. The college possesses its farm and its model barn, wherein scientific methods of breeding and feeding are practiced. By the careful study of past experience and present science, the professor is able to mate animals that will produce the most perfect offspring. So clearly are the laws of breeding understood that almost perfection in the progeny can be secured. Great progress has also been attained in the process of feeding and now the animals by the system of balanced rations will fatten in half the time. The greatest care is shown the animals; they are given the most nutritious food

and the purest water and are housed in sanitary barns, not only insuring them better health, but also keeping them free from diseases arising from unhealthy surroundings. It is here, that the student is taught to breed animals judiciously, and to feed and care for them to the best advantage. Here, also, he learns the characteristics of each breed and what a perfect animal of each type should be.

The student carries this knowledge to his home. He is the coming stock raiser of the country and he brings into practice the things he has learned at college. Because he is an educated man, he is regarded by his neighbors as a model in the improvement of live stock. The agricultural college should, therefore, possess the highest-bred animals in the state; for if the student has formed wrong ideals of perfect animals by judging scrubs at college, not only is his future hampered, but likewise the live stock of his community suffers proportionately.

Most agricultural colleges of the central states rank higher than Ohio in their departments of Animal Husbandry. Iowa College possesses live stock which rivals any in the country; stock which produces perfect offspring and on which scientific feeding can be practiced advantageously. The value of these animals alone aggregates over a hundred thousand dollars. The State of Iowa is convinced that the Animal Husbandry taught at the college pays big dividends, and even the legislature is more than willing to grant money for the continuation of this great work.

Not only do the students help to disseminate this knowledge of animal husbandry over the country, but even old and experienced breeders visit the college to understand more distinctly the latest methods used in the improvement of live stock.

Years ago, the western states recognized that the agricultural colleges are the great benefactors of civilization and now they are doing all in their power to promote the live stock industry. The people of Ohio have not yet realized what is being attempted at the University farm, or there would be more interest manifested by the stock raisers of the state. Ohio rivals any state in her live stock industry, but yet only a few pure bred animals are represented in her state institution. If the University intends to teach her sons the modern methods of Animal Husbandry, she should possess the best animals in the state, for a state institution should be an index of the state it represents.

This has long been recognized by those in charge at the University, but the appropriations have been inadequate. The establishment of a separate department for this work last year it is hoped will lead to wonderful results, as much has been accomplished even with limited means during the past year. It is, however, evident that until the legislature has granted more money for the construction of suitable and sanitary buildings and for the purchase of more pure bred animals the many stockmen of the state will not be convinced of the great improvement possible in the raising of the best types of farm animals.

E. S. POSTON, '05.

A Bibliography of Literature Relating to the Subject of Plant Breeding.

The subject of plant breeding is now assuming considerable importance in scientific agriculture, and the greater part of the literature about it now within popular reach, is of comparatively recent origin. This bibliography is far from complete, but it is submitted in the hope that it may serve as a guidepost to in-

tending plant breeders, whose knowledge, like that of the writer, is still quite limited.

"Plants and Animals Under Domestication," 1: 322-464, 1875. Charles Darwin.

Contains a discussion of the variability, change of habits, ancient history and parentage of cultivated plants, both useful and ornamental.

"Plants and Animals Under Domestication," 2: 7-341, 1875. Charles Darwin.

Includes numerous paragraphs referring to plants and treating of reversion and its causes, results of cross-breeding, sterility and fertility of flowers, effects of man's selection, causes of variability, bud variation, and adaptation of plants.

"Plant Breeding," pp. 293, figs. 20, 1895. L. H. Bailey. Arranged in lectures. The individuality of the plant and its uses in producing and improving varieties are explained. The uses of crossing and hybridizing, with examples of its effectiveness and characteristics are given with quotations from Focke and Darwin. The origin of domestic varieties is illustrated by specific examples, by extracts from Verlot's classification of varieties of ornamental plants, and Carrière's list of bud varieties. Fifteen cautions to be observed in plant breeding are explained, also the structure of flowers and their manipulation in cross-pollination.

"Mendel's Principles of Heredity," pp. 212, 1902. W. Bateson.

Discusses the laws of heredity enunciated by Galton and Mendel; gives translations of Mendel's original papers on hybridization, followed by the author's defense of the principles set forth by Mendel, against the criticism of Prof. Weldon.

"Influence of Environment in the Origination of Plant Varieties," Yearbook of the U. S. Department of Agriculture,

87-106, figs. 16-23, 1896. Herbert J. Webber.

A discussion of the production of variation in plants by food supply, water, light, temperature, the sea, and change of climate, and its application to the origination of varieties.

"Hybrids and Their Utilization in Plant Breeding," Yearbook of the U. S. Department of Agriculture, 383-420, pl. XVII-XX, figs. 1-16, 1897. Walter T. Swingle and Herbert J. Webber.

Treats of all phases of hybridization, its characteristic results and practical application to plant breeding. Separates hybrids into groups and names special features obtained in cultivated plants by hybridization.

"Improvement of Plants by Selection," Yearbook of the U. S. Department of Agriculture, 355-378, pl. XXVI and XXVII, figs. 92-94, 1898. Herbert J. Webber.

Describes methods of selection used to improve sea island cotton, sugar beets, violets, pineapples and citrus fruits. Names special features acquired by selection..

"The Improvement of Our Native Fruits," Yearbook of the U. S. Department of Agriculture, 297-304, 1896. L. H. Bailey.

Mentions what has been done, and what probably should be done especially in the production of special varieties of native grapes, plums, berries and western apples.

"Progress of Plant Breeding in the United States," Yearbook of the U. S. Department of Agriculture, 465-490, pl. XXVI-XXVIII, figs. 22, 23, 1899. Herbert J. Webber and Ernest A. Bessey.

The increase of American varieties and improvement of native species pointed out. A brief account of the early work of Knight and Van Mons is followed by a review of the improvement

of grapes, pears, apples, plums, strawberries, raspberries and blackberries. How the tomato, potato, pea, squash, corn, wheat, flowers, nuts and cotton have been improved in the nineteenth century.

"International Conference on Plant Breeding and Hybridization," Experiment Station Record, 14: 208-222, 1902. Walter H. Evans.

A brief account of the convention held in New York City, September 30 to October 2, 1902. Contains reviews of thirty papers presented, and a list of those presented but not reviewed.

"Progress in Plant and Animal Breeding," Yearbook of the U. S. Department of Agriculture, 217-232, pl. XV-XVII, fig. 21, 1901. Willet M. Hays.

Estimates the increase in value of crops from breeding alone, and gives examples of achievement in breeding of plants and animals. Calls attention to some methods of breeding used by farmers, and to the necessity for co-operation in breed and variety improvement.

"Plant Breeding," U. S. Department of Agriculture, Div. of Vegetable Pathology and Physiology Bull. No. 29, pp. 72, pl. I-VI, figs. 1-21, 1901. Willet M. Hays.

The position of scientific plant breeding is emphasized and its relation to wealth shown by facts about corn, wheat and the sugar beet. Eleven important principles and facts to be observed in plant breeding are enumerated. The uses of variation and hybridization are explained and the possibilities of special lines of plant breeding are applied to specific cases. A full account of methods used in breeding wheat is given.

"Methods of Corn Breeding," University of Illinois Agricultural Experiment Station Bull. No. 82; 525-539, pl. 2, 1903. Cyril George Hopkins.

The demands for corn of different chemical compositions is pointed out and followed by a brief description of methods of corn breeding as now practiced.

"The Survival of the Unlike," pp. 515, figs. 20, 1897. L. H. Bailey.

The volume consists of three groups of essays which are partially given up to the discussion of evolutionary subjects relating to plant life, and partially devoted to discussion of the origin and evolution of certain domestic varieties of plants. E. R. M.

Agricultural Adaptation.

Success in agriculture depends almost solely upon a close study and application of adaptation. If a man not adapted to agricultural pursuits engages in them anyhow, he will make a failure. If a farmer attempts to grow crops on soil not adapted to those crops, he will have but a scanty harvest, and if in selecting his crops he pays no attention to climatic conditions he will not obtain a satisfactory reward for his labor. Sometimes it is a very difficult matter to study out the best adaptation in individual cases, but in most of them there is some accessible criterion.

One of the greatest problems that confronts a young man of the farm is whether to remain on the farm or to engage in some other occupation. What should be his criterion? Unless he is a lover of nature and is interested in the growth of plants and animals, and can derive pleasure from the singing of birds, the blossoming of flowers, the development of plants, and the frolics of young animals, it would not be wise for him to engage in farming, for to such a person farming would be only a life of drudgery. On the other hand, if he enjoys being among stock, taking occasional rambles through the fields and woodlands and has pride in owning a comfortable home,

agriculture will be more pleasant than any of the professions or the mercantile and manufacturing industries. The interest one has in the different occupations should be made the criterion in making the choice. The desire of income is but a secondary consideration. The successful physician is the one who has deep interest in the health of his community and the welfare of mankind. The successful lawyer is the one who concerns himself in seeing the laws executed, in protecting the weak, and in obtaining justice for all. We rarely see a successful author, painter, sculptor, teacher, or minister whose main incentive is money making. Thus also in farming, one should be fitted with a keen interest in the work.

There are very wide variations in the soil and climatic conditions of this country and the consideration of these in their various combinations forms the basis for wide and extensive study. For the purpose of studying these conditions in a practical way with reference to their adaptation to different kinds and varieties of crops and animals our experiment stations were established. For a more theoretical and more extensive study of these conditions and to give instructions in the same, our agricultural colleges have proved to be a great success, and have done a grand work for the uplifting of agriculture. Although our agricultural colleges have done so much for agricultural interests, in studying and applying adaptation, yet there are many farmers who are totally unfamiliar with the nature of the work being pursued. We frequently meet persons who think that a college course in agriculture lays down a fixed set of definite rules that an unexpected shower, drought or freeze would spoil altogether. Such we are glad to say is not the case. Having almost completed my fourth year of the agricultural course, I have as yet heard

no recommendation for any such procedure. In every class we have been impressed with the idea that we cannot adhere to any set of rules, but must think for ourselves what is best under different conditions and what to avoid at other times.

The Bureau of Soils of the U. S. Department of Agriculture is making an extensive study of soil adaptation and up to the present time, it has endeavored to find soils adapted to certain crops. The experiment stations aim more to find crops suited to certain soils.

The question of adaptation enters largely into the use of fertilizers. We frequently see glaring advertisements of different fertilizer companies which tell of immense crops being obtained from the use of their potash or phosphoric acid or nitrogenous compounds, and recommend their use to every one. This is a bold attempt to deceive the farmers. If they should tell the nature and location of the soil, its state of fertility and perhaps the character of the season, some reliance could be placed upon their results, but a general statement is of no value whatever, for in some places their application would be profitable while in others it would be a dead loss.

In selecting machinery, we are again compelled to consider our particular needs. An implement which does excellent work in a sandy loam, may be too light in weight to be of any value on a stiff clay soil.

And thus, in every phase of farm life, with its numerous variations of conditions and circumstances, we find that each particular condition has its particular need and the means of satisfying these needs are as various as the needs themselves. The whole study of agriculture is a study of adaptation and the more we realize this the sooner will we get into the road to success. C. A. McC.

University News.

The Veterinary building is under roof and the work on the Engineering building is progressing very rapidly. Both will be ready for occupancy the first of the year.

The rapidly developing interurban system around Columbus gives excellent opportunities for excursions with classes to prominent farms, orchards and other places of interest. Professors Hunt and Plumb have taken advantage of the opportunities offered and have made several excursions of much value to students with the expenditure of little time and money.

Professor Hunt spent May 19 in St. Louis at a committee meeting of those in charge of the dairy work at the Louisiana Purchase Exposition.

The report of the last meeting of the Ohio Dairyman's Association is in the hands of the printer and will be out in a couple of weeks. Accompanying this in the form of a separate pamphlet will be issued a list of the cheese factories, creameries and skimming stations, with their location throughout the state. This list was prepared by Professor Decker, under the auspices of the Agricultural Students' Union.

A test well is being sunk on the horticultural grounds to determine the possibility of securing well water to supply the University.

General Agricultural News.

W. S. Carlyle, Professor of Animal Husbandry at Wisconsin, has been appointed to a like position at the Colorado Agricultural College.

Samuel Frazer, Professor of Agriculture and Agriculturist at the Briar Cliff School of Agriculture, has been ap-

pointed Professor of Animal Industry at Cornell University.

Frank G. Miller, of Yale School of Forestry, has been elected Professor of Forestry at the University of Nebraska.

The building occupied by the New Jersey State Experiment Station and Agricultural College on the Rutgers College campus, was almost completely destroyed by fire, April 23.

C. S. Murkland, President of the New Hampshire State College, has resigned.

The School of Practical Agriculture and Horticulture at Poughkeepsie, formerly located at Briar Cliff, Manor, N. Y., is to be closed on account of failure to secure necessary funds for buildings and general equipment. The present equipment will be sold.

A short course in stock and grain judging for farmers' institute workers was recently held at the Ontario Agricultural College. It included work in the judging of horses, cattle, sheep, swine and farm crops, with allied work.

The Ohio Experiment Station has established two additional experiment farms, one at Germantown in the tobacco district of southwestern Ohio, with a view to making the study of tobacco problems a prominent feature of the work, the other at Carpenter, in Meigs county, in the hill region of southeastern Ohio, to study the problems peculiar to that part of the state. The sandy land test farm in the northwestern part of the state has been abandoned for the present.

The Carnegie Institution has granted \$8,000 for the establishment and maintenance of a desert botanical laboratory which will be located on a tract of 50 acres near Tucson, Arizona.

The many friends of Robert B. Ogilvie, of Wisconsin, will be pleased to know of his election as Vice President of the Zenner Disinfectant Company, the makers of famous Zenoleum Dip and Disinfectant. Mr. Ogilvie has charge of the Chicago office of that company and is located at 39 Exchange avenue, Union Stock Yards, and will be pleased to see his old friends at any time they are in that vicinity. Any letters addressed to him will also have prompt attention.

Book Reviews.

THE NATURE STUDY IDEA. By Liberty H. Bailey. Doubleday, Page & Company, New York. 160 pages. Price \$1 net.

To those acquainted with Professor Bailey and his writings the subject of this book at once suggests the man. The title itself is a Bailey title and the book is typically a Bailey book. The author is at home on this subject and those who know his original style, his apt, terse sentences and his faculty for saying something will find much here to devour.

The nature study idea is here to stay and the sooner it is grasped by intelligent people the better. Professor Bailey is the champion of this cause and in this book he allows himself full sway. Such subjects as the following suggest the character of the book: The Meaning of the Nature Study Movement, The Integument Man, Science for Science's Sake, The New Hunting, An Outlook on Winter, The Agricultural Phase of Nature-Study.

The book is one for teachers and educators and is full of life, clearness and originality.

HOME BUILDING AND FURNISHING. A combined new edition of "Model Houses for Little Money," by Wm. L. Price, and "Inside of 100 Homes," by W. M. Johnson. Doubleday, Page & Company. New York. 140 pages. Illustrated.

The growing tendency for more convenient and artistic homes among our American people is a fact too well known to need comment. We are building for comfort and utility, yet the aes-

thetic features are not overlooked. With the rapid spread of suburban roads about our great cities the possibilities for home-building are becoming greater each year. This book seeks to gather in convenient and pleasing form such designs and plans of construction as seem worthy, and to discuss in a popular way the general feature of home interiors.

The book is in two parts, the first by Mr. Wm. L. Price on plans for model homes costing from one to four thousand dollars; the second by Mr. W. M. Johnson, on the interior, treating of the separate rooms in turn, with valuable hints and suggestions in abundance.

The book is most beautifully illustrated by excellent half-tones and is a most worthy and desirable publication.

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Wanted: MARCH NUMBERS OF THE AGRICULTURAL STUDENT. By an oversight the March issue was entirely exhausted. Any one returning a March copy to us will receive in return 6 cents in stamps and the favor will be greatly appreciated.

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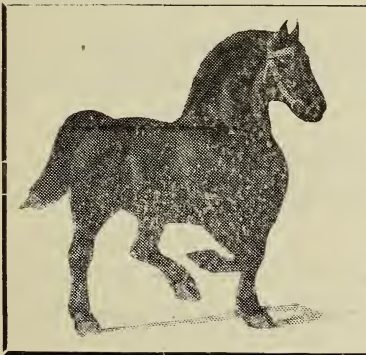
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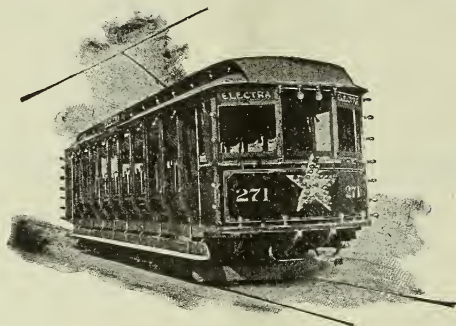
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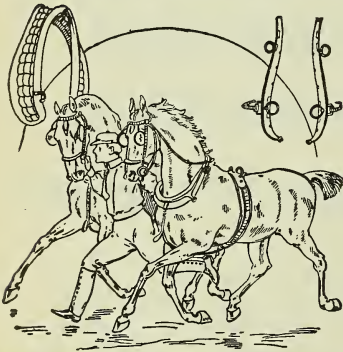
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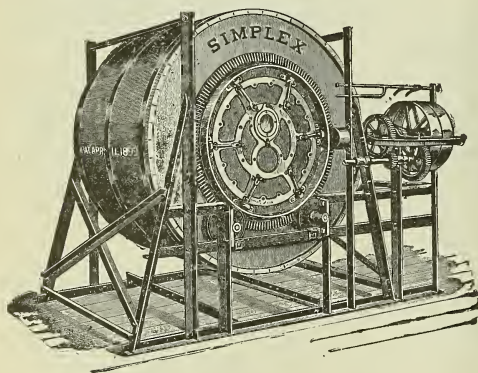
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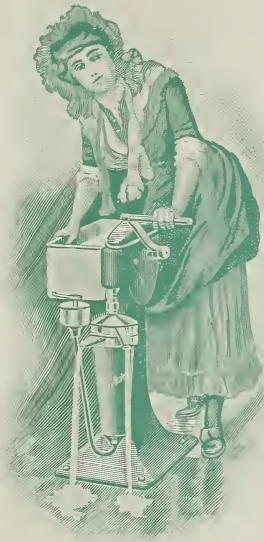
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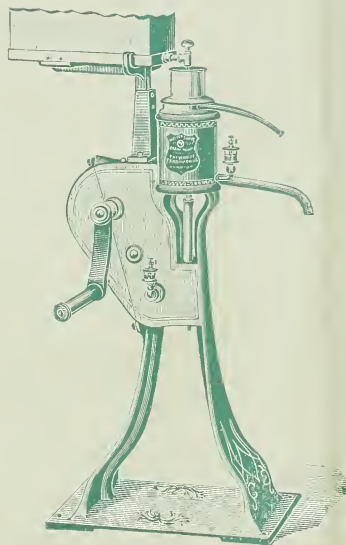
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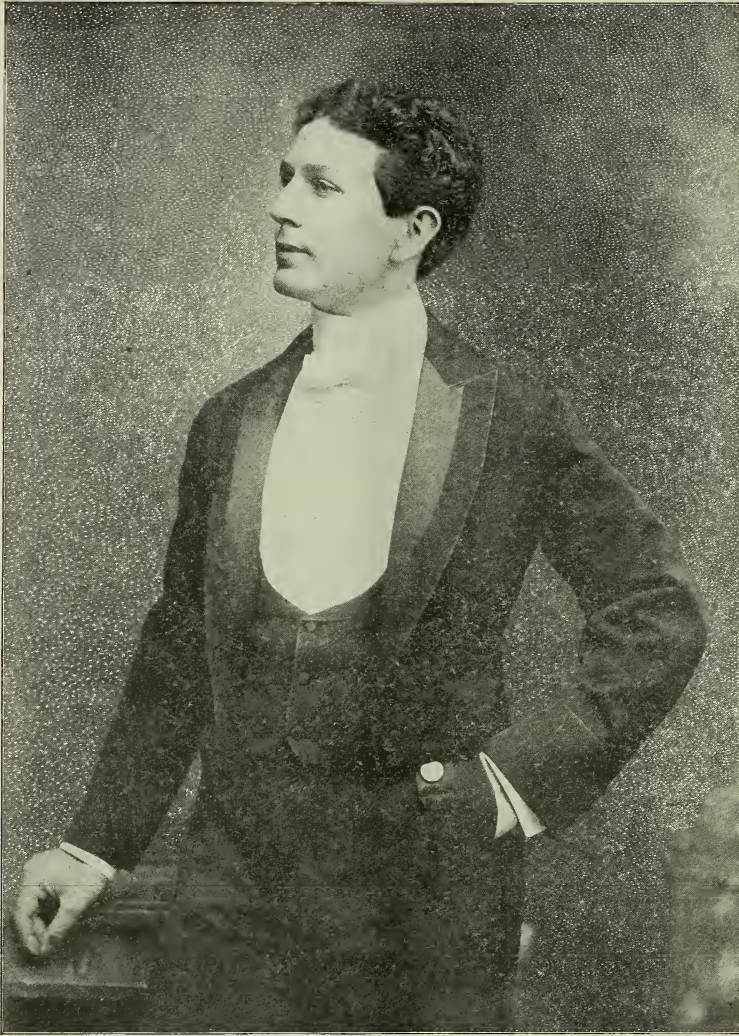
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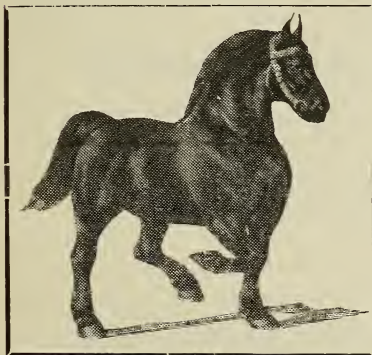
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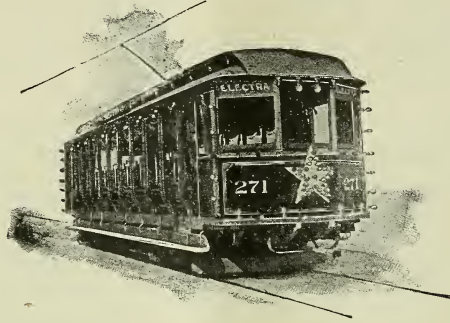
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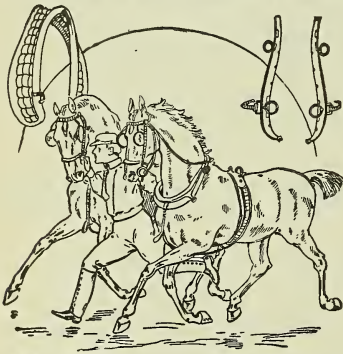
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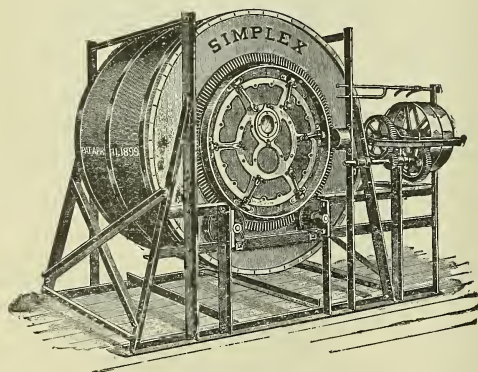
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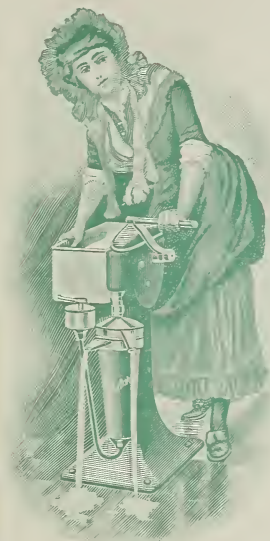
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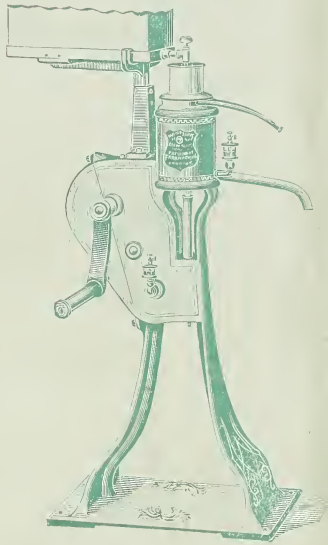
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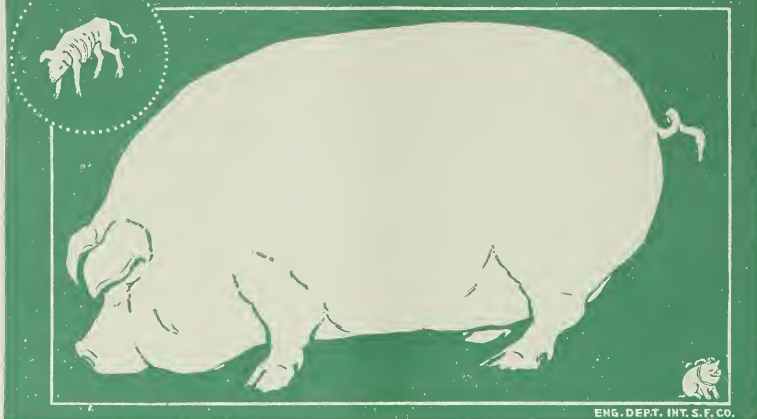


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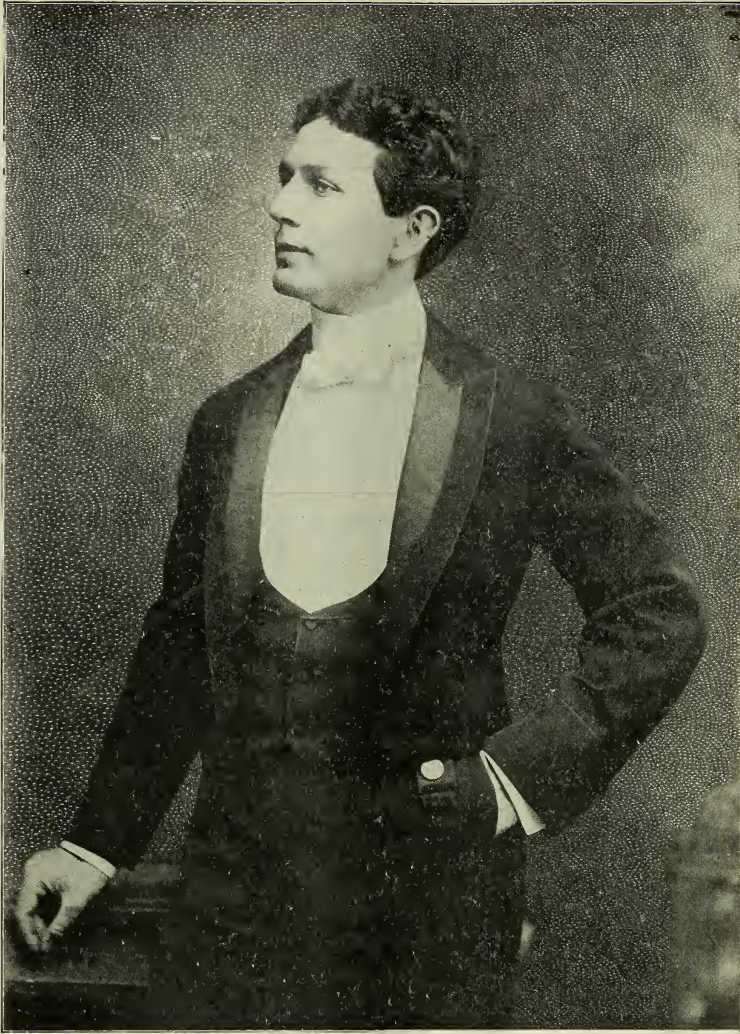
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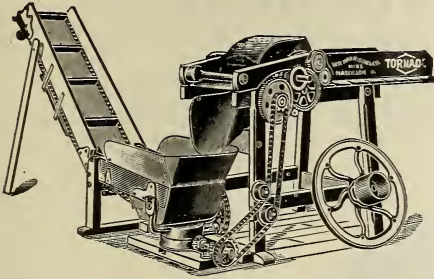
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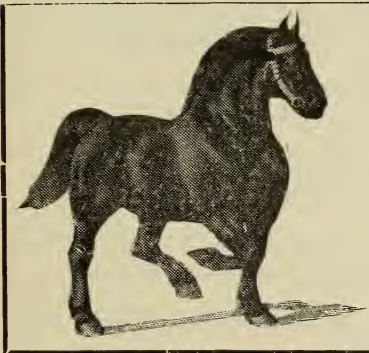
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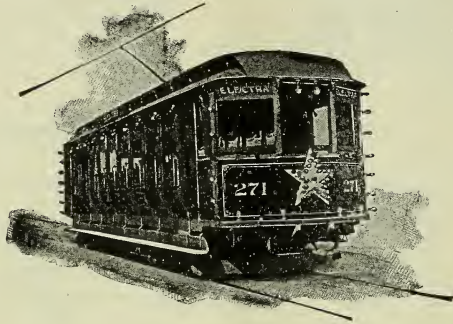
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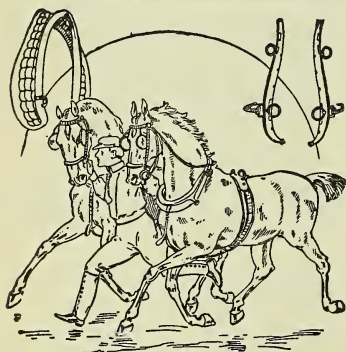
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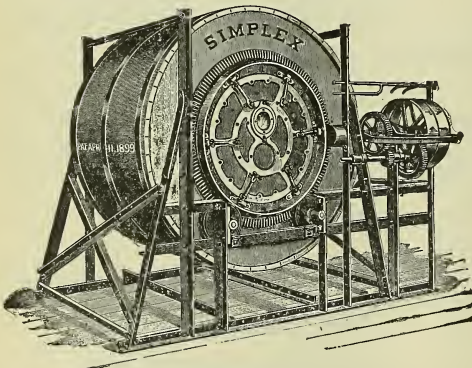
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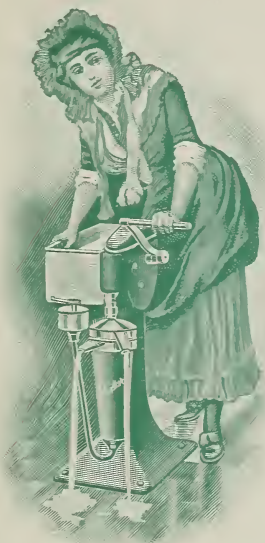
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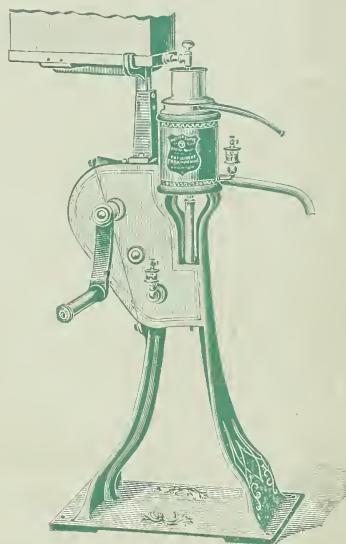
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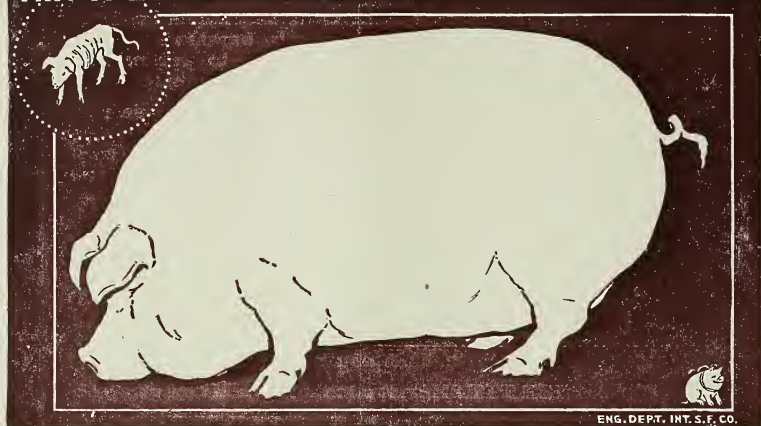
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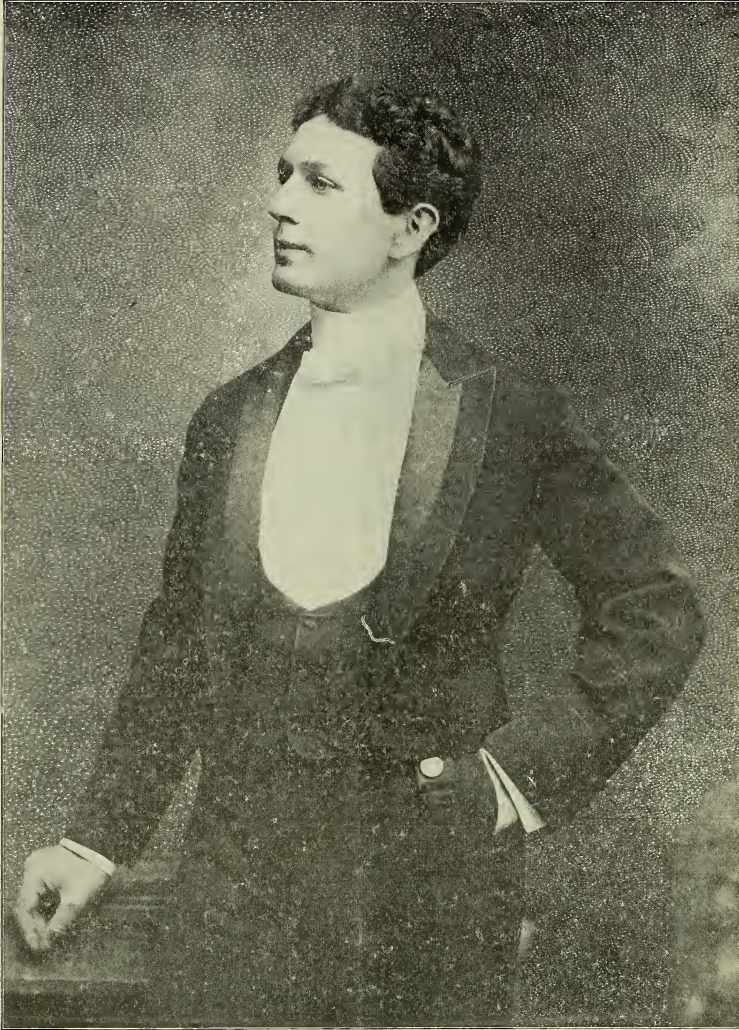
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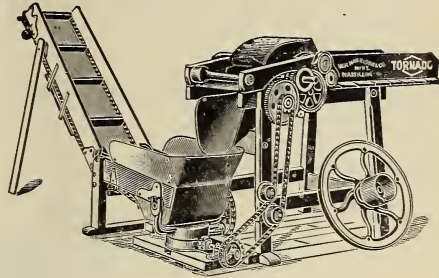
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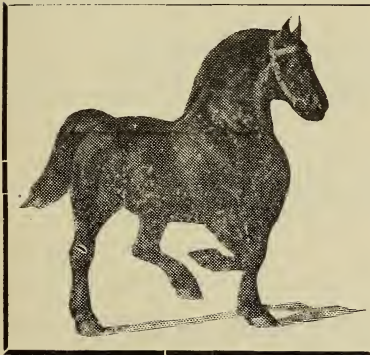
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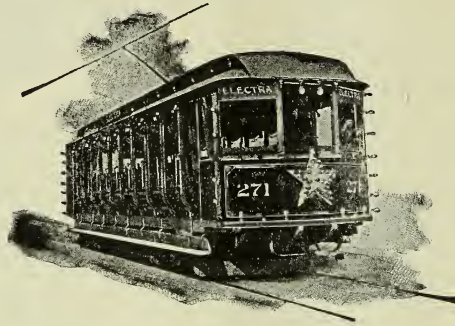
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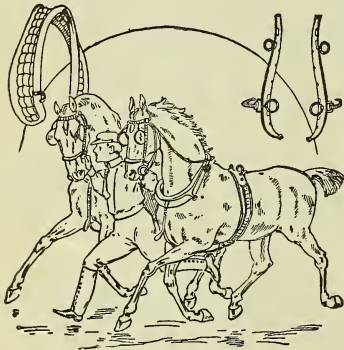
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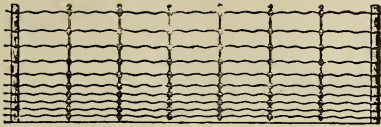
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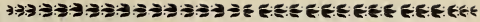
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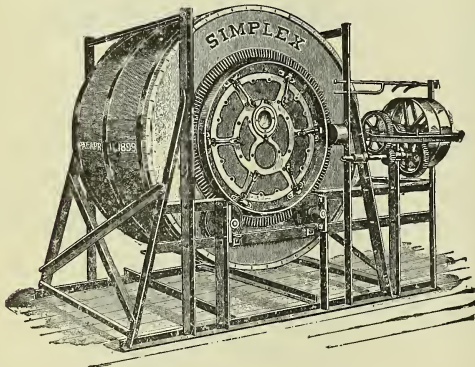
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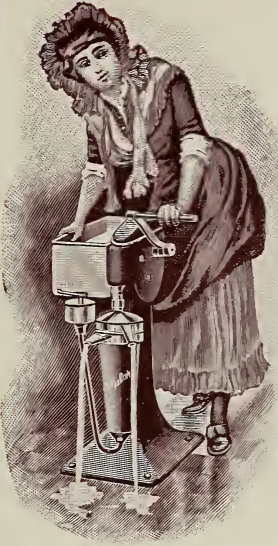
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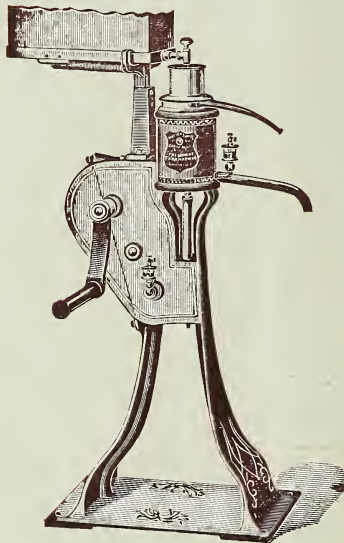
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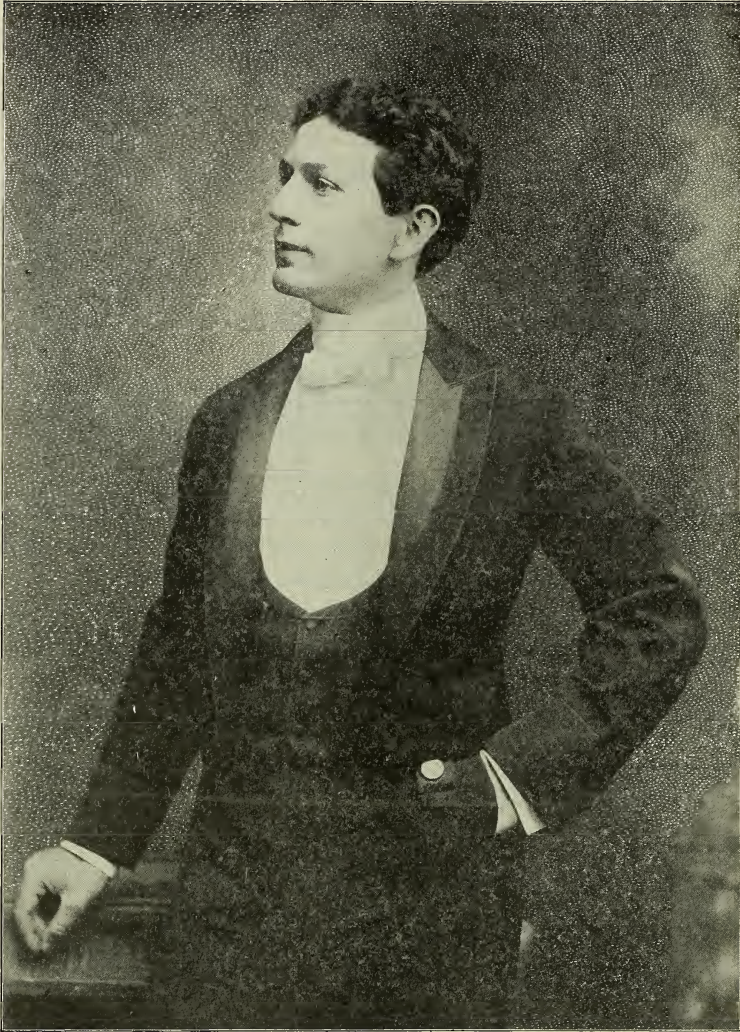
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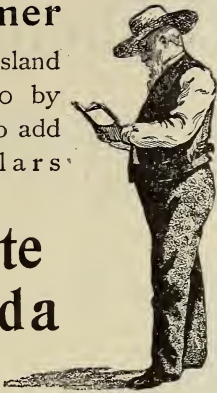


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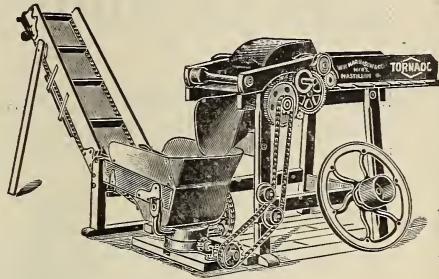
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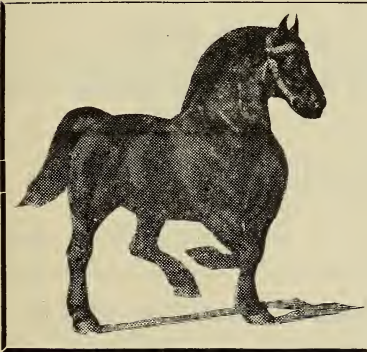
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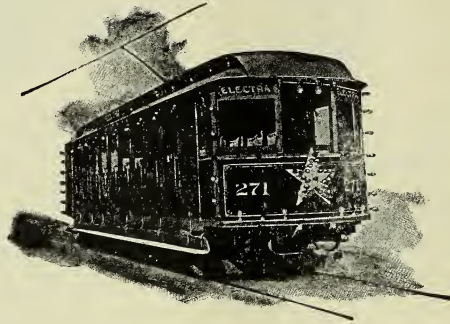
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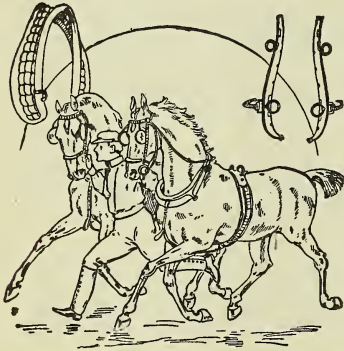
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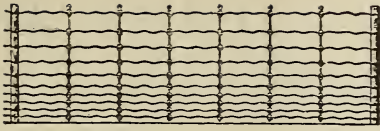
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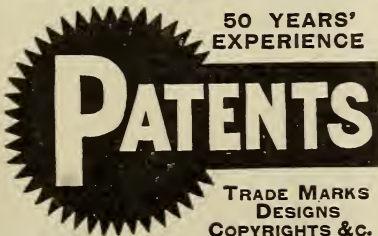


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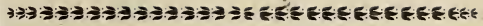
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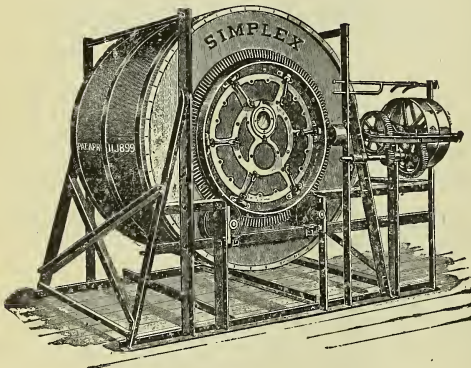
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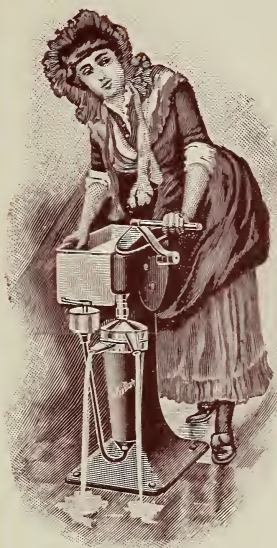
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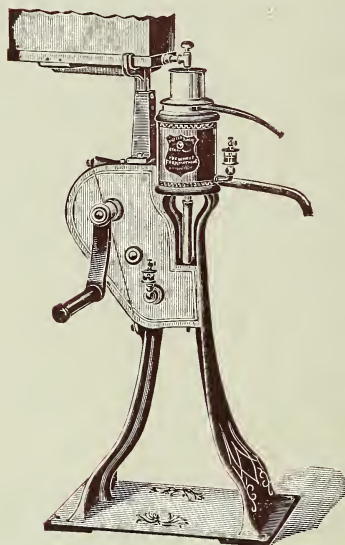
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Vol. IX.

MARCH, 1903.

No. 6.

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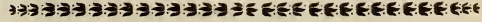
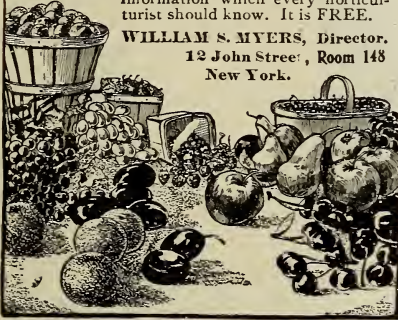
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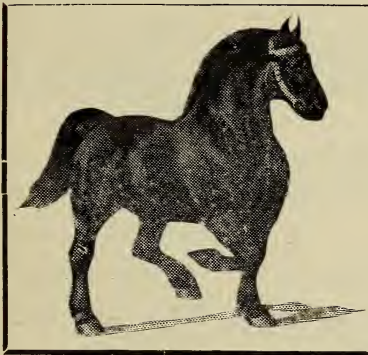
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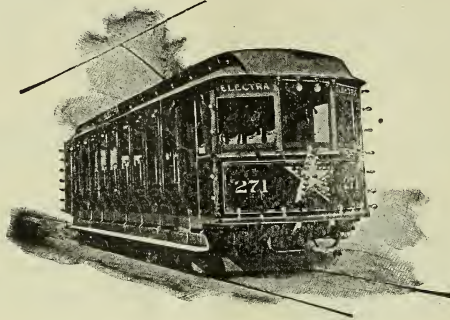
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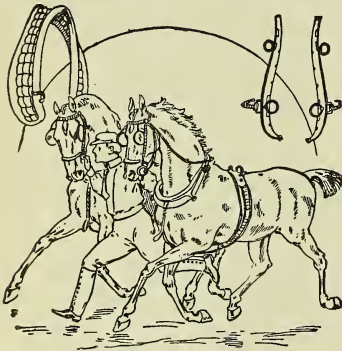
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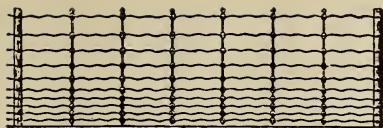
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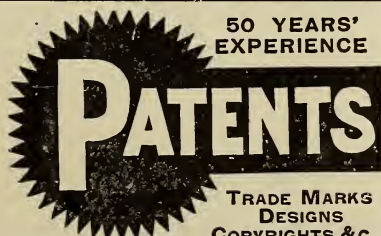
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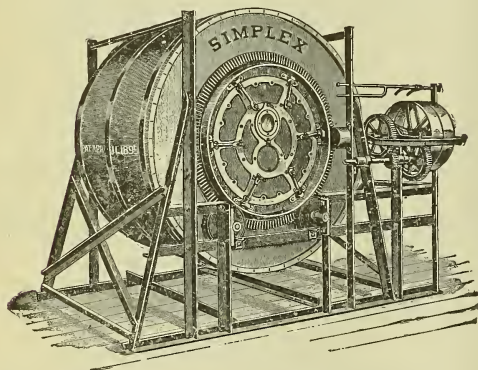
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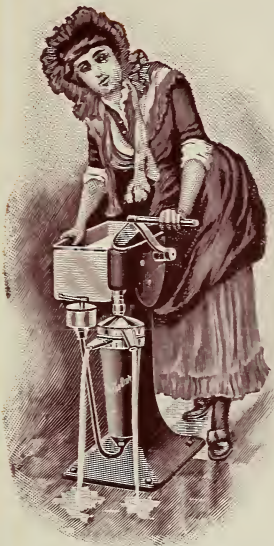
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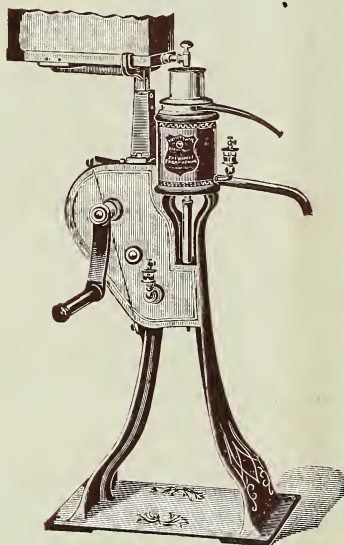
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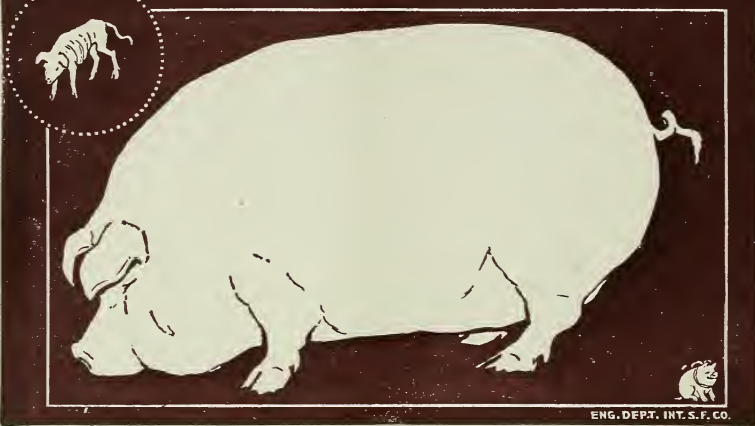
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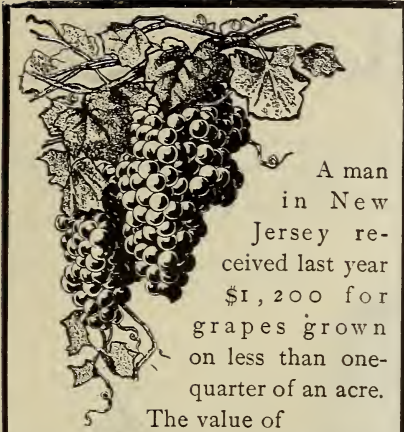
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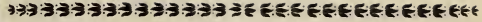
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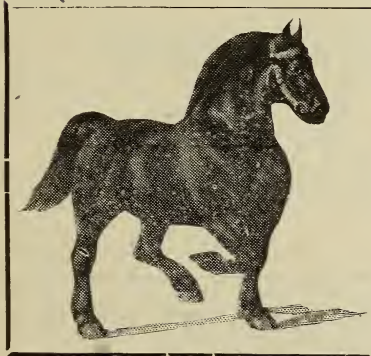
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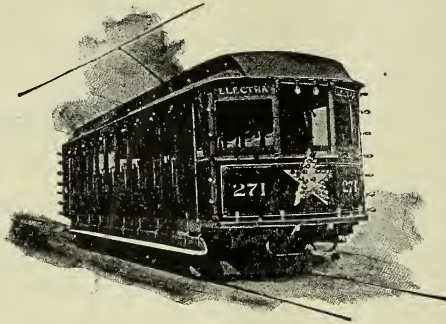
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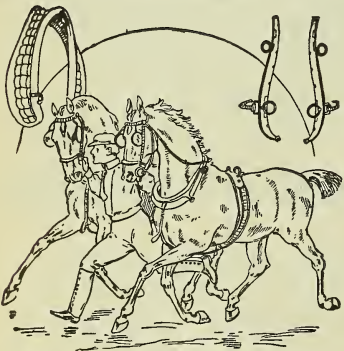
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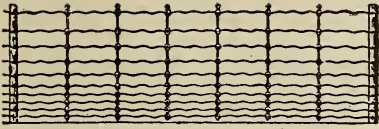
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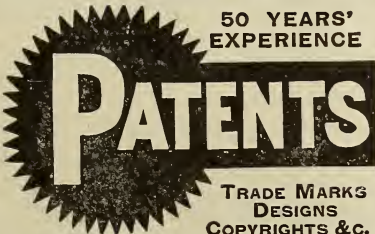


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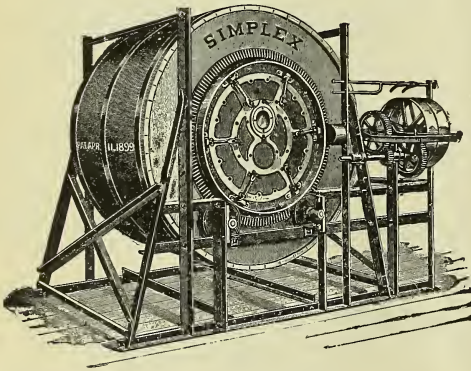
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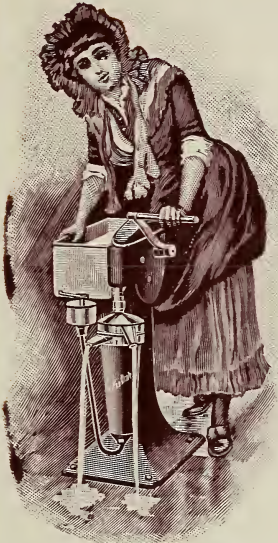
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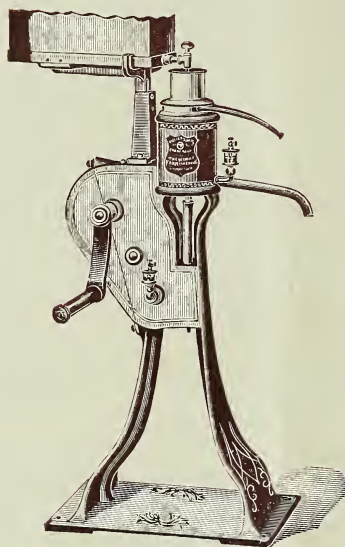
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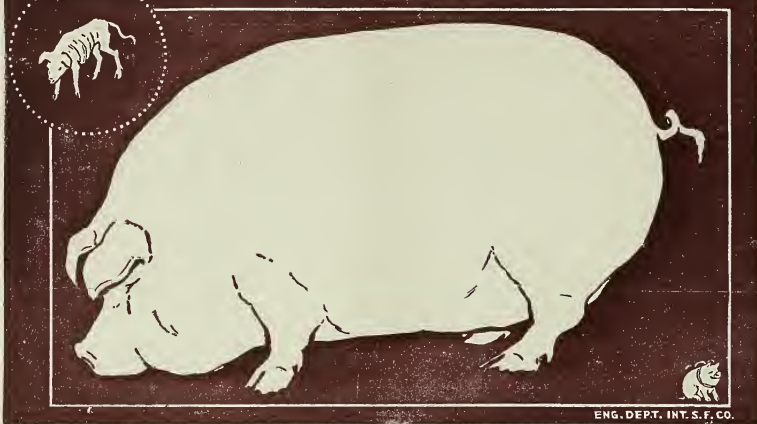
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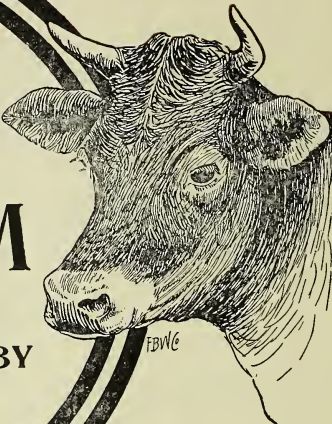
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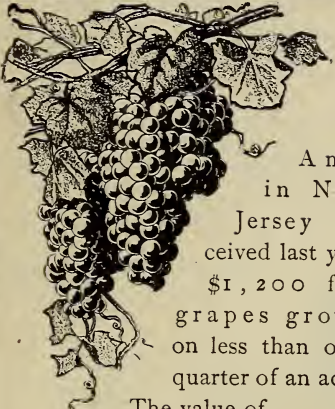
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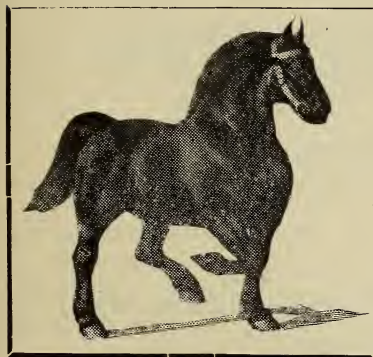
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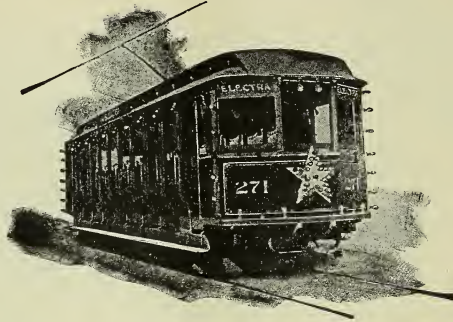
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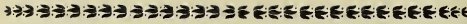


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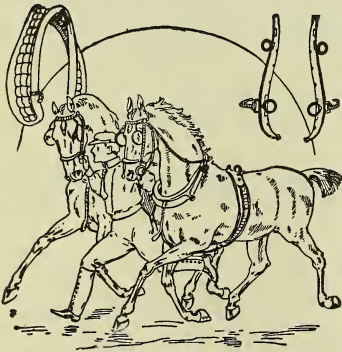


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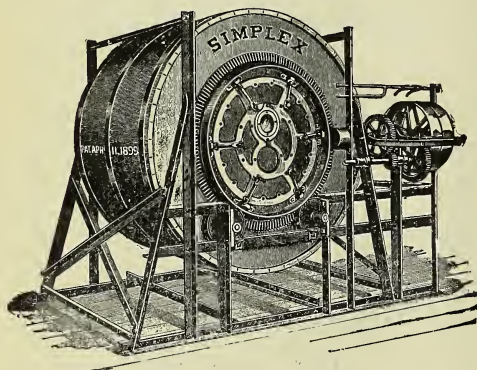
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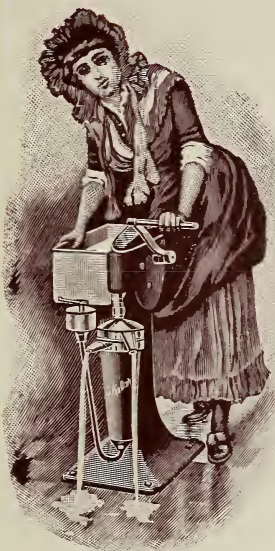
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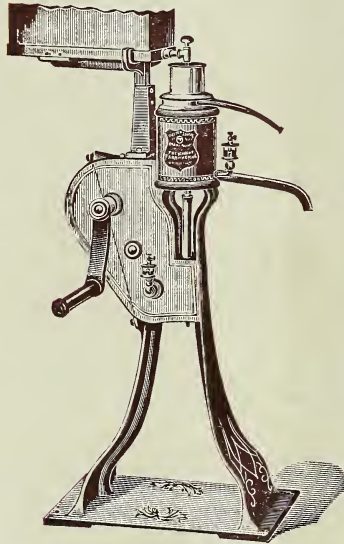
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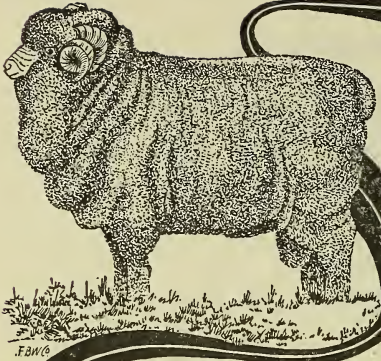
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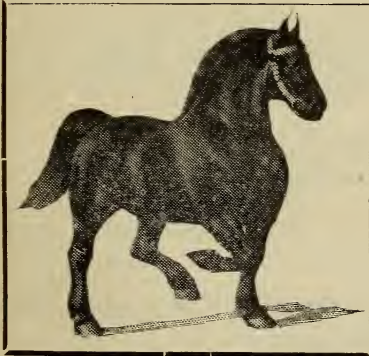
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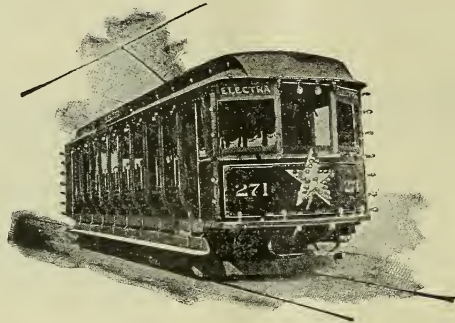
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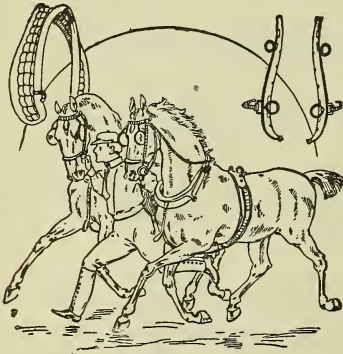
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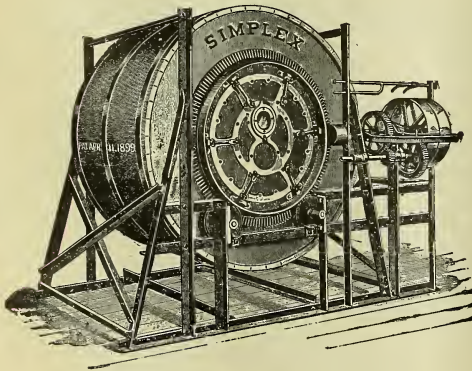
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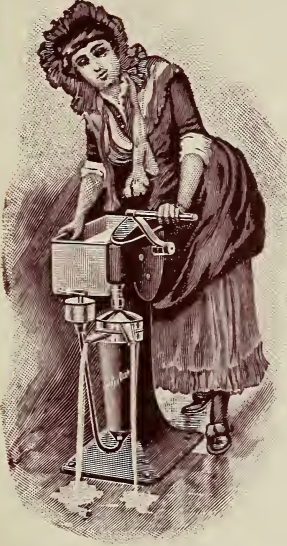
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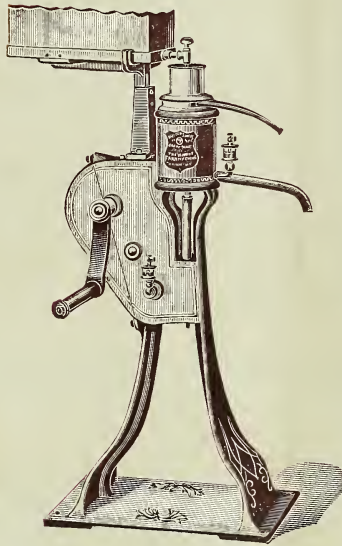
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